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IMPLEMENTATION OF ORGANIZATIONAL CHANGE AT NAS BRUNSWICK: SMART BASE INITIATIVES

by

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June 1999

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This thesis examines the implementation process of three different Smart Base initiatives at Naval Air Station Brunswick, Maine. The purpose of the initiatives is to allow bases to operate more effectively (by allowing base personnel to concentrate more attention on operational responsibilities instead of administrative burdens) and more efficiently (to reduce the amount of resources needed to operate shore installations). This thesis found that successful implementation of Smart Base initiatives depended on the following: strong support, involvement, and resource attainment by the Commanding Officer; thorough understanding of the existing process; a detailed implementation plan (defining tasks and responsibilities for all personnel involved in the change effort); close working relationships with key stakeholders; and marketing of change efforts to achieve buy-in. It appears to be especially difficult to successfully implement change when the new process is not very compatible with existing practices, and any of the critical factors identified above are not present.

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SMART BASE INITIATIVES**

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This thesis examines the implementation process of three different Smart Base initiatives at Naval Air Station Brunswick, Maine. The purpose of the initiatives is to allow bases to operate more effectively (by allowing base personnel to concentrate more attention on operational responsibilities instead of administrative burdens) and more efficiently (to reduce the amount of resources needed to operate shore installations). This thesis found that successful implementation of Smart Base initiatives depended on the following: strong support, involvement, and resource attainment by the Commanding Officer; thorough understanding of the existing process; a detailed implementation plan (defining tasks and responsibilities for all personnel involved in the change effort); close working relationships with key stakeholders; and marketing of change efforts to achieve buy-in. It appears to be especially difficult to successfully implement change when the new process is not very compatible with existing practices, and any of the critical factors identified above are not present.

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I. INTRODUCTION

A. PURPOSE

This is an applied study in the area of implementing change at a major naval shore installation. Of particular concern is the process whereby the Naval Air Station Brunswick, Maine (NASB) has implemented a number of Smart Base initiatives. NASB is becoming a model for creating and implementing various initiatives and programs to cut costs and increase efficiency. This thesis uses applied theories on the management of innovation and change to examine the actual processes involved in implementing changes at a shore installation.

In an era of downsizing and extremely tight budgets within the Department of the Navy, it has become increasingly important to find ways to reduce the cost of the Navy's infrastructure. This research examines several Smart Base initiatives being implemented at the Naval Air Station Brunswick, Maine in an attempt to increase efficiencies and reduce installation management costs. The overall process of Smart Base initiative implementation is outlined in terms of the theories of organizational change and diffusion of innovation.

B. RESEARCH QUESTIONS

1. Primary

How did NAS Brunswick, Maine implement various Smart Base initiatives?

2. Subsidiary

1. What were the major drivers and facilitators for successfully implementing Smart Base initiatives?
2. What were the major impediments to implementing Smart Base initiatives?
3. What were the processes used to overcome or minimize impediments?
4. What were the criteria for undertaking the various Smart Base initiatives?
5. What processes were involved with initiative's formulation, implementation, and expression of benefits?
6. How was implementation effectiveness evaluated?
7. How could implementation be improved?

C. METHODOLOGY

The methodology used in this thesis research consists of an extensive analysis of the methods and processes used by NAS Brunswick, Maine to implement three major initiatives. A literature review focuses on the diffusion of technical innovations and how change is implemented in large, complex organizations. Semi-structured interviews were conducted with 12 base leaders, managers, and practitioners to obtain information on how the various Smart Base initiatives have been implemented at NASB. Interview questions (provided in Appendix A) were structured to elicit perceptions about how well different approaches worked (efficiency) and how effective the methods were in overcoming impediments and constraints. This methodology was designed to yield answers to all the research questions and to provide practical recommendations for base leaders and managers for successfully implementing innovative initiatives.

D. BACKGROUND AND EXPECTED BENEFITS OF THIS THESIS

The Smart Base Project Office is funding initiatives at nine Naval installations in the continental United States. The mission of the Smart Base Project Office is to partner with

commanders to identify, demonstrate and promote innovations that will increase shore installation efficiency while reducing operating costs. The Smart Base Project is the single entity within the Department of Defense searching for solutions to reduce installation operating costs while improving efficiency and sustaining readiness (Lohrmann & Robertson, 1999.)

The Smart Base Project Office initially used the Navy's Smart Ship Project as a model. The Smart Ship Project was chartered to increase the use of technology aboard ship to facilitate reducing crew sizes while maintaining the ability to fulfill mission requirements (Lohrmann & Robertson, 1999.) Smart Base Project Office members focused on identifying areas where technical solutions had potential for providing a substantial return on investment. They decided to use commercially available software and equipment to save developmental costs. The Smart Base Project Office issued a Broad Agency Announcement in November 1996 to solicit technical and business practice solutions from the general public. By Spring 1999 they had reviewed over 300 proposals (Lohrmann & Robertson, 1999.) Promising initiatives were initially implemented at Naval Station Pascagoula, Mississippi and the Portsmouth Naval Shipyard in Maine. As the number of initiatives increased, so did the number of test sites. The Smart Base Project Office plans to eventually implement the most successful initiatives on a Navy-wide basis. A description of several Smart Base initiatives is included in Appendix B.

Captain Lohrmann, program manager for the Smart Base Project Office, identified NAS Brunswick as a leader in implementing several initiatives during a telephone

conversation, and suggested that the lessons learned by studying the implementation process of several Smart Base initiatives at NAS Brunswick could be useful to other installations.

The Naval Studies Board assessed the progress made by the Smart Base Project Office over the first two years of its existence and found mixed results (Naval Studies Board, 1998.) For example, they state that several Smart Base initiatives require connectivity between modern computers, but assert that many installations lack this connectivity. The Naval Studies Board (1998) found several other areas of concern. They insist that the Navy “...lacks the private sector’s ability to integrate systems in order to solve business problems...”, and say that this hamper’s the Navy’s ability to use commercial technology. The Naval Studies Board (1998) stressed that most of the Navy’s data is stored and processed on obsolete computer systems, and very few Navy personnel are familiar with operating and maintaining these systems. Updating these systems and integrating them with modern commercial equipment poses a substantial challenge.

The Naval Studies Board (1998) found that high level sponsors of the Smart Base initiatives appeared to work directly with installations. This could be problematic, because fleet and regional commanders have no stake in the success of the initiatives.

The Naval Studies Board (1998) stated the purpose of the Smart Base initiatives is to reduce costs and improve performance. However, they noted the Smart Base Project Office has not made cost visibility a metric to track the costs and return on investment of the initiatives. They did note that it is still too early to evaluate the success of many of the initiatives. Another concern cited by the Naval Studies Board is the lack of a coordinated plan to extend successful initiatives from the test sites to other installations.

This study examines the process of implementing change by analyzing how NAS Brunswick, a large naval shore installation, implemented three Smart Base initiatives. It provides examples of the potential benefits and impediments commonly encountered during the implementation process (and how one installation overcame these impediments), as well as pitfalls to avoid during implementation. This analysis should assist installation leaders and managers who are attempting to adapt to a changing military, social and political environment, while reducing infrastructure and cutting costs.

II. BACKGROUND

A. DISCUSSION OF THE SMART BASE PROJECT

The Smart Base Project Office was established in 1996 as a reinvention laboratory to identify means of increasing the Navy's shore installations' efficiency, mission readiness, and cost (Lohrman & Robertson, 1999). The Smart Base Project Office operates under the direction of the Chief of Naval Operation's Director of Shore Installation Management (N46).

The Smart Base Project's goal is to "...achieve cost avoidance by eliminating redundant efforts and facilitate the sharing of ideas, technology solutions, and better business practices...." (Lohrman & Robertson, 1999). The Smart Base Project Office issued a Broad Agency Announcement (BAA) to solicit ideas and proposals for improving infrastructure business practices and reducing costs. From various proposals, Smart Base team members developed several initiatives that they planned to implement at various test sites (16 initiatives are being actively pursued.) The initial pilot sites selected to test the Smart Base Initiatives were Naval Station Pascagoula, Mississippi, and the Portsmouth Naval Shipyard in Kittery, Maine. As more initiatives were developed and other installations expressed interest in participating, the number of test sites increased. The other installations now serving as Smart Base Project demonstration sites are Naval Air Station (NAS) Brunswick, Maine, NAS Lemoore, California, NAVSEA Headquarters Crystal City, Virginia, Naval Station (NAVSTA) Norfolk, Virginia, NAVSTA San Diego, California, Naval Surface Warfare Center (NSWC) Port Hueneme, California, and Naval Air Warfare Center (NAWC) China Lake, California.

NAS Brunswick, the focus of this thesis, is a Master Maritime Patrol Base located 200 miles north of Boston. NASB supports P-3 and C-130 aircraft squadrons and 32 other tenant commands, and employs approximately 5,000 military and civilian personnel (NAS Brunswick, 1998.) NASB began an Information Technology (IT) Initiative in October 1996. The Commanding Officer's goal was to develop a modern IT infrastructure, to reduce operating costs, and to improve the efficiency of base operations. NASB's leadership discovered that this plan was well aligned with the goals of the Smart Base Project Office, and began to develop a close working relationship with the Smart Base Project Office as they considered, planned, and implemented several initiatives. NAS Brunswick has attempted to develop nine separate Smart Base initiatives. Four of these initiatives have been successfully implemented. Three Smart Base initiatives are still being developed, and two were cancelled. A brief description of all nine Smart Base initiatives is included in Appendix B.

The next section of this chapter will describe three Smart Base initiatives that were tested at NAS Brunswick and were the focus of this thesis.

B. DESCRIPTION OF SPECIFIC SMART BASE INITIATIVES

1. Small Procurement Electronic Data Interchange (SPEDI)

The Small Procurement Electronic Data Interchange (SPEDI) initiative was originally developed by the Naval Air Warfare Center (NAWC) China Lake, CA. SPEDI permits users to input orders for items such as office supplies into a personal computer with internet capability. The user simply logs onto the SPEDI website using any internet browser. The web site is maintained and updated daily by NAWC China Lake. Anyone may view the

online catalog, but passwords are required to place orders. The SPEDI web site displays the online catalog for the vendor. The user enters a name or description of the desired item, and the web site presents a list of items that match with detailed physical descriptions and photographs available for all listed items. The user can then either choose an item and place it in an "electronic shopping cart", or reject the item. If the user has purchasing authority, he completes the order online. If the user does not have purchasing authority, the list of items in his "electronic shopping cart" is emailed to the designated supervisor with purchasing authority. The supervisor then reviews the list and approves or rejects any of the requested items.

Once an order has been approved, it is transmitted to the vendor within one hour. The vendor ships the order that business day, and packages arrive within one to two business days. Shipping costs are not added to any orders – the customer pays only the catalog price. The vendor attaches a barcode label to all outgoing packages. The barcoded information includes a description of the package contents and prices, ordering office, and points of contact. When the package arrives at the base's receiving office a barcode reader is used to decode this information and electronically acknowledge receipt of the shipment (which starts the payment process), then the package is routed to the ordering office. The barcoding system also helps streamline the paperwork process by providing an electronic record of each order.

NAWC China Lake has produced a promotional videotape about the SPEDI initiative as part of a marketing campaign to convince other installations to implement SPEDI (NAWC China Lake, 1996). The videotape presents several measurable results that NAWC China Lake has achieved by implementing the initiative. They have been able to reduce the

procurement lead time from approximately ninety-five to three days. SPEDI also has reduced the cost of processing each purchase request by 65 percent, and provided paperless proof of delivery. NAWC China Lake has been able to negotiate quantity discounts of 10 to 70 percent below the price normally charged by vendors. Vendors agreeing to participate in SPEDI are promised payment in ten days, instead of the traditional thirty days; they receive payment by electronic funds transfer (EFT). EFT also holds advantages for naval installations – it is cheaper than issuing paper checks. As a result of these factors, NAWC China Lake stated that they have been able to reduce the inventory carried by the base's Supply Department, and reduce the size of their labor force. The videotape noted that the "real-time" data collection capability provided by the barcoding system provides an automated audit trail and helps improve vendor accountability (NAWC China Lake, 1996).

Installations implementing SPEDI have to purchase the barcoding equipment and provide access to computer terminals to procurement personnel in each work center. In addition, Supply Departments have to change some of their receiving and payment procedures to conform with SPEDI requirements. Vendors who participate in the SPEDI initiative also are required to purchase barcoding equipment, and must have an internet-capable computer.

2. Docushare

The Docushare initiative is part of Smart Base's Paperless Administration (Paperless Admin) concept. The goal of Paperless Admin is to minimize administrative costs such as paper and ink, while providing access to timely information. This innovation has been implemented by NAS Brunswick, Maine.

The Commanding Officer of NAS Brunswick was seeking a way to improve how his installation's directives were maintained and updated. In response, his Information Technology (IT) Director examined several commercially available software packages that could be used to electronically store and display these instructions over personal computers connected to the base intranet. The IT Director recommended that the Xerox Corporation's Docushare software be utilized, and the Commanding Officer approved the recommendation. Since this effort fit well with the Smart Base Project Office's Paperless Admin concept and could be readily applied to other installations, Smart Base agreed to help fund the initiative.

Instructions that were already stored electronically (documents written on common word-processing programs and stored on disk, for example) were managed by the Docushare software with no modifications. A scanner was used to convert paper documents into electronic format. Once an instruction was in electronic form, it was saved to a dedicated server, which placed the information on the base's intranet. Access to view or update the instructions is controlled with passwords.

The conversion of instructions to electronic format has not yet been fully accomplished (approximately 80 percent of instructions had been converted by May 1999). Thus, specific measures of impact have not yet been accomplished. However, installation managers and Smart Base team members believe that Docushare will reduce administrative costs and improve efficiency in several ways. First, file storage requirements (the number of file cabinets and space needed to house them) will be reduced. The timeliness of information will be improved – updated instructions can be viewed by everyone as soon as they are saved on the server, eliminating the delays previously experienced as paper instructions were

printed, delivered, and filed. Administrative costs will be reduced as these requirements for processing paper documents were eliminated. Overall, this could result in lower manpower requirements, particularly on larger installations.

Installations desiring to implement Docushare have to commit significant resources, however. In addition to the cost of the Docushare software itself, the Xerox Corporation requires that licenses be purchased for every person on base who will be using the software to revise instructions. Certain infrastructure must also be in place – a base intranet, adequate server capacity, and access to personal computers connected to the intranet are essential. A scanner must also be obtained to convert paper documents into electronic format.

3. Jetform

The Jetform Initiative was another element of the Smart Base Project Office's Paperless Admin concept. Smart Base team members informed the Information Technology (IT) Director of Naval Air Station (NAS) Brunswick, Maine, that they were seeking a test site for an initiative that would help reduce the administrative burden on installation leaders and managers by routing common documents throughout the command electronically. They anticipated that this could improve efficiency by reducing the delays inherent in physically moving paper documents through several offices (often located in several separate buildings on the installation). The Commanding Officer and IT Director of NAS Brunswick agreed to partner with Smart Base to have Brunswick serve as a test site for this initiative.

Personnel from the Smart Base Project Office and NAS Brunswick reviewed several commercial software packages before selecting Jetform. Jetform allows electronic versions of forms to be routed via the internet or base intranet. The implementation team decided to

demonstrate the technology by automating special request chits. Special request chits are forms submitted by Sailors to their chain of command to make formal requests. The request may require approval at several levels in the chain of command, depending on its nature. However, only the Commanding Officer has authority to disapprove a special request.

The contents of the form were easily constructed electronically. The more difficult part of the automation process was developing programming code for each decision point in the routing process. Computer code had to be written to support routing of the electronic form. This programming was relatively complex, and had to be done by an experienced Jetform programmer. However, Smart Base team members and NAS Brunswick IT personnel believed that the decision points and programming required to support many common forms would be very similar from base to base. Because of this, they felt that once a form had been programmed for one base, it would be readily transferable to other installations with very few changes required.

The implementation team envisioned a user typing her request into a computer in her workcenter. This request would be instantly transmitted to her immediate supervisor via the base intranet. If her supervisor was on leave or failed to respond to the request within a predetermined time frame, the request would be automatically forwarded to the next person in the Sailor's chain of command. The request form would be instantly returned to the Sailor once a decision was made.

NAS Brunswick leaders saw several advantages to this system. The current method of hand routing paper request chits was time consuming. If a chit had to be approved by a supervisor in another building, it was routed by an internal guard mail system, and arrived at

the other building the next day. This process had to be repeated after the chit was approved. The paper form could also sit in a supervisor's in-box for several days for many reasons. Chits could, and sometimes did, "get lost in the system". In addition to rapid routing, the electronic version offered better visibility of the document. The Administrative Officer would be able to view the status and location of all electronic special request chits. Leaders at NAS Brunswick felt that the combination of rapid routing and better visibility of special request chits would help to improve the morale and quality of life of Sailors.

III. LITERATURE REVIEW

A review of the literature on organizational change management revealed several common themes and critical factors associated with implementing organizational change. These factors included such ideas as the importance of a shared vision among stakeholders, communicating that vision, managing resistance to change, and the necessity of detailed planning. Many of the literature sources also noted that setbacks are common and inevitable, and a plan must be developed to manage these pitfalls. Specific literature sources are discussed below.

A. DIFFUSION OF INNOVATIONS

In *Diffusion of Innovations*, Rogers (1983) discusses the process by which an innovation is communicated among the members of a social system. Rogers states that four main elements affect this dissemination process. The first is the characteristics of the innovation itself. He states that the rate of adoption of an innovation depends on its perceived relative advantage to the status quo, its compatibility with the organization (e.g., technologies, values, reward system, available skills/resources), its level of complexity, and whether the innovation can be implemented in a limited way. The second element discussed by Rogers is the importance of using appropriate communication channels such as mass media or personal meetings to disseminate a shared vision of the innovation.

The third main element discussed by Rogers is time. He states that there are five steps that an innovation passes through. The first of these steps is initial knowledge of the

innovation. This is followed by persuasion, in which the key decision-makers may form a favorable or unfavorable impression of the innovation. The next stage is the decision, where this impression is acted on. If a favorable decision is reached, the innovation is then implemented. The implementation stage is followed by confirmation, which occurs when the organization adopts or rejects the innovation. Rogers's fourth main element is the social system, with a structure (that may be composed of individuals, groups, and organizations), norms, opinion leaders, and change agents.

B. MANAGING THE PROCESS OF ORGANIZATIONAL INNOVATION

Van de Ven builds upon Rogers's work in the article *Managing the Process of Organizational Innovation* (1993). Van de Ven presents a process model of organizational innovation based on the innovation adoption and diffusion model developed by Everett Rogers. He states that Rogers's model presents the process of innovation as a linear sequence of three stages. These stages begin with the invention of an idea (developed in response to organizational needs or problems). The next stage includes development of the innovation into a program, then the process concludes with diffusion to and adoption by users.

Van de Ven describes five substages of Rogers's stage of innovation diffusion. The first of these occurs when the innovation unit begins marketing and creating awareness of its innovation using a variety of media choices. This initial attempt to create awareness of the innovation is often followed by personal contacts and informal influence from opinion leaders (Van de Ven, 1993). The second subphase focuses on arousal of interest by a potential user of the innovation. Van de Ven states that factors such as perceived need, and the organization's

innovativeness, norms, resources, and communication behavior influence how much interest is aroused in the potential user of the innovation. Once the user is persuaded that the innovation has merit, an evaluation is conducted. Rogers's model assumes that the innovation is more likely to be adopted if: it appears to have a strong relative advantage over other alternatives, it is highly compatible with existing practices, it is not too complex, a small-scale trial can be conducted, and results of the trial can be observed.

Van de Ven (1993) states that the adoption decision is often followed by a trial implementation. A successful trial frequently results in wider implementation and institutionalization of the innovation, and unsuccessful trials usually result in rejection of the innovation.

Van de Ven describes common patterns that were observed in the process of innovation development by researchers of the Minnesota Innovation Research Program (MIRP). These researchers formed interdisciplinary teams to track the progress of innovations in fourteen separate fields. Analysis revealed that none of the innovations developed in a linear sequence of separate stages over time, as described by Rogers's model (The stages described by Rogers include idea invention, development, adoption, and diffusion.) Van de Ven believes that the implementation of innovations is a much "messier" and more complex process than proposed by Rogers's model. He then notes that six characteristics were commonly found in the developmental process of all innovations:

- 1) The innovation process consists of an accumulation of several events performed by numerous people over lengthy time periods; innovations typically can not be traced to an act by an individual on a particular date in a particular place.

2) Actions to allocate resources and initiate the development of innovations are triggered by “shocks,” not persuasion. People must first reach a threshold of sufficient dissatisfaction with existing conditions.

3) The process does not follow a linear sequence of stages and substages. Once an innovative idea is developed, the process diverges into complex paths of activities.

4) Setbacks frequently occur during the innovation process -- plans go awry or unanticipated events happen. Setbacks can cause the innovation to be rejected or can present opportunities for learning and reinvention.

5) Receptiveness to innovations and adoption speed increase when the innovation is initially developed locally, and decrease when users are not allowed to modify innovations that were initially developed elsewhere.

6) Management cannot ensure the success of an innovation, but can take steps to improve its odds. For example, the odds of success increase with experience (as management learns from previous innovation efforts), and decrease if the innovation has great novelty, size, or a lengthy implementation time.

Van de Ven devotes the remainder of his article to further discussion of these six concepts, and proposes an enriched model based on Rogers’s work and including these characteristics. He adds that chance plays a significant role in whether an innovation is adopted, and that managers can improve their odds by altering the organization’s “structural context” to enable and motivate innovative behavior. This context is composed of the legitimacy (resulting from an organization’s reputation), resources, structure, and culture of the organization. Van de Ven acknowledges that it is difficult to change an organization’s

culture and legitimacy in a short time period, but notes that much can still be done to promote innovations. He identifies several critical enabling conditions for implementing innovations. These include sufficient resources for innovation, frequent communications across departmental lines (including people with dissimilar viewpoints), moderate environmental uncertainty, cohesive work groups with open conflict resolution mechanisms, access to innovation role models and mentors, and moderately low personnel turnover.

Van de Ven (1993) suggests that implementing an innovation on a small scale and spreading it incrementally may not be the best approach. He cites a study by Lindquist and Muriel (1989) which compared two common approaches to implementing innovations. An innovation is simultaneously implemented across several organizational units in a breadth strategy. In a depth strategy, the innovation is first implemented and tested in one site before being introduced to other organizational units. The cited study found that the breadth strategy was more successful in adopting and institutionalizing innovations in two public school districts.

Van de Ven also describes several steps which facilitate learning and reinvention and can be applied to the adoption of innovations originally developed outside of the organization. These steps include modifying the innovation to fit the local situation, active involvement of top management, and facilitating coordination among diverse groups of people to maintain momentum.

Van de Ven (1993) acknowledges that innovations having varying levels of novelty require different management techniques. He identifies the five dimensions of innovation novelty which are reflected in Rogers's model: an innovation's relative advantage,

compatibility, complexity, trialability, and observability. Van de Ven states that these dimensions are important for evaluating an organization's ability to manage the implementation process.

Van de Ven goes on to describe several "contingencies" in the innovation development process. These contingencies include the temporal duration of the innovation (interest and commitment diminish with time), and the size and scope of the innovation. He suggests that small organizations may hold an advantage in starting innovations, but larger organizations with more resources have a greater chance of successfully implementing innovations.

C. CHANGING THE ESSENCE

In their book *Changing the Essence*, Beckhard and Pritchard (1992) describe ways to manage the change process. They state that the initial step faced by organizations is choosing a fundamental change strategy. They advocate an incremental, "first things first" approach to implementing organizational change. They note that significant change will affect working relationships throughout the organization and with stakeholders. They state that it is essential for leaders to have a clear vision of the desired end state. Top leaders must make a personal investment to develop and build commitment for the initiative. They must also be able to diagnose the changes needed to move the organization from its present state to the desired end state. A well thought-out change plan should map out major changes in the organization's policy and practices that are needed to reach the desired end-state. Beckhard and Pritchard

also believe that a dedicated change management team is more helpful than following the normal operational hierarchy in many cases.

Beckhard and Pritchard (1992) detail steps needed to create a learning organization. They write that feedback and replanning are the essential core of change management. The first stage in creating a learning organization is developing a learning process. This involves “unfreezing” the current organizational culture, absorbing new attitudes or behaviors, then “refreezing” the culture after these changes are institutionalized.

They note that the single most important instrument in the change process is management behavior as management guides the organization from the present state, through the transitions, to the changed state. An organization can demonstrate management commitment in several ways. Personal commitment by the organization’s leaders is essential, as is enrolling the commitment of the majority of the key players. Managers can also provide rewards for employees who demonstrate learning behavior. Education and training about the initiative is essential for all affected personnel. Finally, information must be managed throughout the change process – feedback is critical.

Beckhard and Pritchard (1992) discuss four key aspects of vision-driven change. These include creating and setting the vision, communicating this vision to all stakeholders, building commitment to the vision, and organizing and aligning the organization’s members actions with this vision. They then describe ways to align the organization for change by suggesting that the roles and relationships of all employees should be examined, as well as the organization’s human resource policies and practices. Special attention should be given to an innovation’s implications to systems of information and financial management.

Beckhard and Pritchard (1992) describe strategies for managing the change process, building commitment, and improving communication within the organization. They state that the tasks to be done must first be identified and clearly defined. Management should then focus on creating organizational structures dedicated to accomplishing these tasks. They stress that the knowledge and experience levels of personnel in the organization are more critical than their position in the organization's hierarchy, and should therefore be considered.

Beckhard and Pritchard (1992) discuss the importance of developing a critical mass (the smallest number of people or groups whose commitment is needed for change to occur). An important part of this process is determining the minimum commitment needed from these key people. They suggest asking whether each person or group is needed to "make it happen, help it happen, or let it happen (by not blocking the process)" (p. 78).

Beckhard and Pritchard (1992) explain how to develop a commitment plan. The first stage is problem finding, in which people concerned with change meet to identify and clearly define a problem. Certain rules should be followed during problem finding: the problem must be bounded and must have minimum structure. Several other tools can be used to build commitment. These include role modeling by the organization's leadership, changing the reward system, reallocation of responsibility, and charting the responsibilities of all "actors" in the process. They stress the importance of communication, and state that passive communications, which are typically directed one-way (downward), are less likely to result in commitment than active communications, in which everyone involved in the change process participates. Beckhard and Pritchard (1992) acknowledge that they raised more questions

than they answered, and hope their work will be a useful guide to leaders as they develop their own answers.

D. ORGANIZATIONAL TRANSITIONS

In *Organizational Transitions*, Beckhard and Harris (1987) present additional insight into managing change in complex organizations. Their work begins with an explanation of the demanding world of the manager. They explain that the number of stakeholders forming an organization's constituency have increased over time. They note that demands from the outside environment have also increased for many organizations. Examples of increasing complexity include the following: controls from government agencies and regulatory bodies, social trends and pressures by citizen groups, legal constraints through new legislation, and constraints by interdependent institutions such as unions. They state that many organizations have changed their values and cultures in response to these increasing demands. Beckhard and Harris conclude that these changes in the state of the organizational world have generated an increasing need for effective change management strategies for organizational survival and growth.

Beckhard and Harris (1987) outline the key aspects of the change process in a complex organization. The first of these aspects is diagnosing the organization's present condition and need for change. They emphasize the need to first define the problem and identify its cause. Once this is done, the organization's leaders must determine the desired end state. To do this, goals must be set for the organization's new condition after the change. In order for the change effort to have the greatest chance of success, they suggest that the expected

organizational structure, personnel policies and reward systems, managerial roles, and task responsibilities be clearly defined in as detailed a manner as possible.

Management's next task is to design a strategy for coping with the inevitable confusion that will arise during the transition state. Beckhard and Harris (1987) state that the important issues to be considered include determining the degree of choice about whether to change, determining what needs changing, determining where to intervene, and choosing intervention strategies. They stress it is very difficult for stable organizations to change, and recommend that temporary systems or structures be used to manage the change. They state that the central question is, "What is the most appropriate management system and structure for effectively managing this ambiguous transition state of affairs so that it creates the least tension with the ongoing system and the most opportunity to facilitate and develop the new system?" (p. 46). Although the answer will vary widely depending on the organization and change effort being attempted, they identify some necessary traits for change agents.

Leaders of the change effort must have the clout to mobilize the resources necessary to keep the change effort moving, and should also have the respect of the formal leaders of the organization, since many balancing decisions must be made about what resources are to be dedicated to the change effort. Change managers must also have effective interpersonal skills, since persuasion may be more effective in the change effort than force or formal power.

Once the transition management structure has been determined, then a "process plan" must be developed. Beckhard and Harris describe the process plan as a roadmap for the change effort. They state that an effective process plan should have several characteristics. It should be purposeful – activities in the plan should be clearly linked to the change effort's

goals and priorities. It should be task-specific – tasks should be clearly identified, not generalized. It should also be integrated – discrete tasks should be linked. The process plan should also be time-sequenced and adaptable, and it should have the support of the organization's senior leadership. Finally, the process plan should be cost effective in terms of both time and manpower requirements. However, a process plan alone cannot be relied upon to guide an organization through the change process. Planners must determine who in the organization must be committed to the change effort for it to be successful.

A commitment plan describes a series of steps taken to secure the support vital to a change effort's success. These steps include identifying individuals or groups whose commitment is essential, defining the "critical mass" needed to provide the energy for change to occur, developing a plan to gain commitment from this critical mass, and developing a monitoring system to assess progress. Beckhard and Harris suggest several possible alternatives that could be used to gain commitment for the change process. These alternatives include clarifying a problem or need, using a training course or educational event to increase awareness of a problem, beginning change efforts in areas of the organization that are "hurting," changing the organization's reward system, changing the behavior of leaders (who function as role models), and using forced-collaboration mechanisms (requiring people to work together or take on new roles).

Beckhard and Harris (1987) next address the issue of monitoring and evaluating change. They suggest that the following types of questions will eventually arise: "How do we know that the change effort has been worthwhile? Has the change effort worked? How do we know how much of the outcome is the result of the change effort? How do we know the

new state will be maintained? How do we monitor the change?" (p. 85). They note that serious consideration of evaluation issues and development of evaluation measures should occur in the early stages of the change effort. They suggest including the following elements as an evaluation plan is developed: clearly defining the purpose of the evaluation, determining the types of information needed by management (as well as sources of that information), choosing data-collection methods while considering time and resource constraints, deciding when to gather and review data, and identifying who will use the information produced. They also note that many of the people who supply their perspectives or opinions will expect feedback, or a reasonable explanation of why feedback cannot be provided to them. Several common pitfalls faced by organizations as they evaluate change efforts are highlighted. Organizations must ensure the validity of data gathered. To avoid building resentment, a clear distinction must be made between evaluation of the change effort and the evaluation of performance by individuals.

Beckhard and Harris (1987) conclude that successful change in complex organizations is and probably will remain mostly an art, not a science. But they note that systematic procedures in the planning and management of change can help. They stress that one of the biggest traps facing organizational leaders is the temptation to rush through the planning stage to get to the action stage.

E. CHANGING BY DESIGN

Although Zell's *Changing by Design – Organizational Innovation at Hewlett-Packard* (1997) describes a commercial organization that implemented change, many of the ideas presented apply to public organizations as well. Zell describes how managers successfully

reorganized two divisions of Hewlett-Packard, and identifies several elements of their strategy that he believes contributed to successful implementation of change.

At Hewlett-Packard, a senior manager led a team of eighteen personnel which used a "Bull's Eye Model" of concentric rings to represent the organization's major systems. A graphical representation of this model is presented in Figure 1. The team first identified the organization's purpose and vision (or values) which formed the center of the model. The team developed the next ring of the model, which they termed the Business System. The Business System is composed of the organization's strategy, objectives, and operating principles. The next ring was termed the Technical System. The team analyzed the organization's technology, structure (work units), and job design (employee roles), and included these as elements of the Technical System. The next layer of the model (Support System) includes measurement and feedback systems, as well as the organization's information, communication, and decision making systems. Finally, the People System forms the outer ring of the model which includes the organization's culture and reward system, evaluation and training policies and practices. Elements were included in the model based on team consensus.

Zell (1997) states that several prerequisites must exist before change efforts are attempted. A key element to obtaining commitment from employees is trust. Employees must feel that they will be treated fairly, and must share in information (both positive and negative) which affects their jobs and futures. Zell writes that once trust has been established, employees will be more willing to take on additional responsibility and work as a team. He also says that managers and employees should share power because sharing power helps

create a sense of ownership and responsibility, and broadens the perspectives of employees. Zell contends that a sense of ownership is an invaluable aid to overcoming resistance to change.

Once organizational change has occurred, Zell insists that new employee behavior must be institutionalized or the new behavior may not last. The organization's structure, policies, and practices may all have to be modified to reinforce the change. For example, the organization may need to alter its personnel evaluation and reward systems to achieve a better fit with the changes that have occurred.

Zell (1997) concludes by describing several obstacles to organizational change. He notes that strong support from the organization's top leadership is essential to the success of any change effort. Leaders must be willing to take the risks associated with changing all aspects of a complex organization. In many cases, they must also be committed to pushing power and authority downward, and they must be strong champions of the change effort to gain commitment from people at lower levels in the organization. He notes that many managers are not comfortable with shifting authority downward or dealing with changing beliefs and assumptions throughout an organization's work force. Another possible obstacle results when the long time periods required to implement change in complex organizations become discouraging for both managers and employees. Zell also highlights the difficulty of "transferring learning" or extending new attitudes and behaviors from a small group to a critical mass of people in the organization. Finally, Zell writes that diffusion of change is very difficult. People who were not involved in the creation and implementation of change may fail to understand and support the effort. He concludes that organizations must dismantle

bureaucratic structures and develop flexible, decentralized structures with more power and authority at lower levels. He stresses that organizational change in complex organizations is likely to be successful only if it has the full participation and support of all employees.

F. WHY CHANGE PROGRAMS DON'T PRODUCE CHANGE

In the article *Why Change Programs Don't Produce Change*, Beer, Eisenstat, and Spector (1990) assert that managers often misunderstand how to accomplish organizational change. They declare that "successful change efforts focus on the work itself, not on abstractions like participation or culture." They conducted a four-year study of organizational change at six large corporations, and present six steps to effective change based on their observations. They noted that many of the organizations that successfully implemented change did not focus on formal structures and systems, but instead created ad hoc organizational arrangements. They believe that the most effective way to change employees' behavior is to impose new roles, responsibilities, and working relationships on them. They also state that three interrelated factors are essential to successfully implementing organizational change: coordination (or teamwork), high levels of commitment to the change effort, and new competencies. Examples of new competencies that may be required from employees include increased knowledge of the business as a whole, and greater emphasis on analytical skills and interpersonal relations.

Beer et al. describe six recommended steps, the "critical path," to successfully achieving organizational change in complex organizations. The first of these steps is to mobilize commitment to change through a joint diagnosis of business problems. The authors state that the starting point of any change effort should be clearly defining a business problem,

and suggest that this is best accomplished by using all of the organization's people. In this way, a shared diagnosis emerges of what is wrong, and what can be improved. This approach also helps develop commitment for the change effort.

The next step is to develop a shared vision of how to organize to improve competitiveness. During this step, top management introduces a task-aligned vision of the organization in which members have new roles and responsibilities. To lessen resistance, Beer et al. (1990) recommend that formal structures, titles, and compensation be left unchanged at this stage.

The third step is to foster consensus for the new vision, and the competence and cohesion needed to enact it. At this stage, the changes in goals, responsibilities, roles, and new relationships will help the learning process by fostering new skills and attitudes. Beer et al. (1990) also recommend replacing managers who cannot or will not adjust to the change. They stress that this should only be done after the managers have had a chance to prove themselves. If they are removed too early, the whole organization may become demoralized.

The fourth stage of change is to spread revitalization throughout the organization without pushing it from the top. Beer, Eisenstat, and Spector (1990) suggest that the role of top management is to provide general guidance, and that the details of implementing change should be left to the individual departments of the organization.

Once the four steps described above have been implemented, the next stage is to institutionalize the change through formal policies, systems, and structures. This will help ensure that the positive aspects of the change effort continue even after key people involved in the implementation effort move on.

The final stage of implementing change is to monitor and adjust strategies in response to problems encountered during the change process. The authors stress that the organization must continually monitor its behavior if it is to adapt to a changing environment.

In summary, Beer, Eisenstat, and Spector (1990) state that organizations need a specific mindset for managing change. This mindset should emphasize the change process over the specific initiative and should recognize that change is a step by step process, rather than a series of unrelated programs. Management and employees should also recognize the long-term benefits of implementing a change process over introducing a series of "quick fixes". They conclude that organizational change can be successful only if this long-term view is taken.

G. USING BALANCED SCORECARD AS A STRATEGIC MANAGEMENT SYSTEM

In *Using Balanced Scorecard as a Strategic Management System*, Kaplan and Norton (1996) present four processes that can be used to link an organization's strategic and short-term objectives. These four processes form what the authors term a "balanced scorecard." The first process, "translating the vision," is designed to help managers build consensus for the organization's vision and strategy. A key part of this process is to clarify the vision so that it is understood by all employees. Kaplan and Norton state that to be effective, vision and strategy statements should be expressed as an integrated set of objectives and measures that describe long-term success factors.

The second process described by Kaplan and Norton is "communicating and linking," whereby managers communicate their strategy throughout the organization and link it to

departmental and individual objectives. To align employee performance with the organization's overall strategy, management must engage in the following activities: communicating and educating, setting goals, and linking rewards to performance measures. Communication about the strategy should reach all levels of the organization, and those expected to execute the details have to be educated about the objectives that must be met. High-level strategic goals must also be translated into objectives and measures for lower-level departments and individuals. Kaplan and Norton suggest that top management should ask personnel at lower levels to define several performance measures for their objectives, and to set target levels for each measure. They add that reward systems should be linked to the new performance measures.

The third process described by Kaplan and Norton (1996) is "business planning" involving the integration of business and financial plans to ensure that the budget supports the strategy. The next stage is to select measures of progress from all of the balanced scorecard processes and set targets for each measure. Managers should then determine what actions are needed to reach these targets (the few critical drivers), allocate the required resources, and establish specific milestones to measure short-term progress towards the strategic goals.

The fourth process of the balanced scorecard is "feedback and learning." This process includes articulating the organization's shared vision by clearly defining (in operational terms) the results that the company is seeking. This process should also provide strategic feedback. Organizations can analyze the correlation between changes in performance drivers and changes in associated goals, and use this information to help improve future decisions. Kaplan and Norton state that this strategy review is essential to "strategic learning" or learning at the top

levels of the organization. They conclude that their balanced scorecard enables an organization to align its operations with its strategic objectives, and focuses the attention of all members on implementing long-term strategy. They state that the balanced scorecard provides a sound framework for implementing strategic change.

H. SUMMARY

As the introduction to this chapter stated, the literature review revealed several common themes and critical factors associated with implementing organizational change. These factors included such ideas as the importance of a shared vision among stakeholders, communicating that vision, the necessity of commitment from top leadership, managing resistance to change, and the necessity of detailed planning. Several of the authors also stated that setbacks are commonly encountered.

The importance of a shared vision is one of the key factors to successfully implementing organizational change that emerged from the literature review. A shared vision is created by developing a clear picture of the desired future state of the organization. This vision should be closely linked to the organization's strategy. Key stakeholders should be committed to this vision; it should be reached by a consensus of stakeholders (Rogers, 1983; Beckhard & Harris, 1987; Beckhard & Pritchard, 1992; Beer, Eisenstat, & Spector, 1990.) The existence of a vision is not enough – it must be clearly communicated throughout the organization. Managers can obtain feedback from members throughout the organization while communicating the vision, and can use this feedback to improve the vision. Communication may also help to build the needed commitment to the vision from the

organization's stakeholders (Beckhard & Harris, 1987; Beckhard & Pritchard, 1992; Kaplan & Norton, 1996.)

Several authors of change management literature assert that the commitment of the organization's top leaders is essential to successfully implementing change (Beckhard & Pritchard, 1992; Kaplan & Norton, 1996; and Van de Ven, 1993.) It is hard to obtain commitment from people at lower levels in the organization if they perceive their leaders are not committed to the change effort. Trust between the organization's leaders and employees at lower levels is an essential element in building commitment (Zell, 1997). Commitment to the change effort by all of the organization's stakeholders, although ideal, is both unlikely and unnecessary. What is needed is the commitment of a "critical mass" of stakeholders (Beckhard & Pritchard, 1992.) This critical mass is composed of the minimum set of stakeholders whose support is needed to successfully implement change. The composition of this critical mass will vary widely, and depends on the organization's structure, its complexity, and the influence of the various stakeholders (Beckhard & Pritchard, 1992.)

The change management literature suggests that even a clearly articulated vision that has the commitment of a critical mass of stakeholders is not enough to bring that vision to fruition. An implementation plan that clearly defines tasks to be accomplished and includes the roles and responsibilities for each person involved in the change process is necessary to realize the organization's vision (Beckhard & Harris, 1987; Beckhard & Pritchard, 1992; Kaplan & Norton, 1996.) Beckhard & Harris (1987) assert it is essential to carefully manage the transition state if the organization is to successfully reach the desired end state. They

suggest developing temporary management systems and structures to facilitate the transition to the end state.

Numerous change literature authors have asserted that resistance to change efforts should be expected, and managing this resistance is an important component of an implementation plan. Strong support from top leadership and the commitment of a critical mass of stakeholders can help reduce resistance to change efforts (Beckhard & Pritchard, 1992; Zell, 1997; Beer, Eisenstat, & Spector, 1990.) Measures such as changing the organization's reward system, reallocating the roles and responsibilities of personnel, and maintaining open communication among the organization's members can also be used to help diminish resistance to change (Beckhard & Harris, 1987; Beckhard & Pritchard, 1992.) Beer, Eisenstat, and Spector (1990) suggest replacing personnel who are unable to adjust to change in the organization.

Even when sources of resistance are recognized and address, setbacks are commonly encountered during the implementation process (Van de Ven, 1993.) These setbacks can occur when plans go awry or when unanticipated events happen. Setbacks cannot be eliminated, but thorough planning can help reduce the chance of encountering unanticipated events. Van de Ven (1993) warns that setbacks can have serious consequences, even leading to the termination of the change effort. However, they can also provide important opportunities for learning and improve the success of the change.

Evaluating and monitoring change efforts is necessary to ensure that the change effort is proceeding as planned, and to modify the plan if needed. Measurement and feedback should be used to determine the effectiveness of the change effort, and for managers to gain

insight into both the positive and negative aspects of the change (Beckhard & Harris, 1987.) An accurate evaluation of the effort is also needed to help leaders decide whether to adopt or cancel the initiative being implemented.

Finally, it is critical to institutionalize changes that have been made (Zell, 1997; Beer et al., 1990). For example, the organization may have to change its personnel evaluation, reward systems, or information systems to achieve a better fit with the changes that have been made.

The next chapter examines three separate change efforts that were conducted at NAS Brunswick, discusses which of the common factors identified above were observed in the change efforts at this installation, and which factors were not observed.

IV. METHOD, RESULTS, AND ANALYSIS

A. METHOD

NAS Brunswick has done work on nine separate Smart Base initiatives. Three of these initiatives (SPEDI, Jetform, and Docushare) were chosen as subjects for this thesis. These initiatives were selected because substantial effort had been invested in developing them, and they were typical of innovations that could be adopted by other installations. SPEDI and Docushare have been successfully implemented. The Jetform initiative was eventually cancelled, but the lessons learned during the implementation effort may prove useful to other bases implementing change.

Data for this thesis were primarily obtained by interviewing 12 people involved in implementing Smart Base initiatives at NAS Brunswick and the Portsmouth Naval Shipyard. A list of the questions that were used for the interviews is provided in Appendix A. Other sources of data included minutes of five implementation team meetings, observation of one of these meetings, observation of a demonstration of one of the initiatives, and observation of the implementation results.

Senior leaders and managers were formally interviewed in their offices, and more junior personnel were interviewed in their work spaces. Interview questions were derived from relevant change management literature to elicit data about how a large, complex organization might implement change. Results of recorded interviews were summarized and compared to concepts that emerged from the change management literature.

Eight people from NAS Brunswick were interviewed – the Commanding Officer, the director of the Information Technology (IT) Department (who supervised the implementation of all the Smart Base initiatives), as well as people who implemented the three Smart Base initiatives. The Supply Officer and his deputy were interviewed about their roles in implementing SPEDI. A Supply Department worker who conducted training on SPEDI and assisted users was also interviewed. The IT Director, a senior IT Department manager, and a files clerk were interviewed about their roles in implementing DocuShare. The IT Director and two senior IT Department managers were interviewed about their attempt to implement Jetform. A Supply Department officer who supervised implementation of SPEDI at the Portsmouth Naval Shipyard was also interviewed. Additionally, the Smart Base Initiative Coordinator at the Portsmouth Naval Shipyard was interviewed, along with two Smart Base Project Office team members. All interviewees were promised anonymity (i.e., no names associated directly with comments) to encourage candid responses. All interviews were tape recorded (with permission). Interviews averaged thirty minutes in length. The shortest interview lasted twenty minutes, and the longest lasted slightly over two hours. Most interviewees did not see the actual questions prior to the interview. However, each person who was interviewed was contacted by telephone several days prior to the interview. During these telephone conversations the purpose for the interviews was explained to the interviewees, as well as the types of questions that would be asked.

B. RESULTS AND ANALYSIS OF INTERVIEWS

1. Commanding Officer's Perspective

The Commanding Officer (CO) has a unique perspective from the other senior personnel involved in implementing the Smart Base initiatives. In command of NAS Brunswick for nearly two and one half years, the CO made modernizing and improving the installation's information technology (IT) infrastructure one of his top priorities. He stated that he was satisfied with the overall progress that had been made in implementing the nine Smart Base initiatives (see Appendix B for a list of these initiatives). He expressed that although some initiatives stalled, others were very successful. Some of the indicators he used to measure success included survey results, feedback from his Department Heads at weekly meetings, and "deckplate" discussions and observations. He said Sailors he spoke with seemed generally satisfied with all of the implemented initiatives.

The CO identified several major factors contributing to successful implementation of the initiatives. He emphasized the importance of getting employees to "buy in" to the initiatives. To accomplish this, initiatives have been "marketed" by conducting informational seminars on the initiatives, ensuring potential users would have access to necessary training, and clearly articulating that each initiative had strong support from the top. He helped the implementation teams to achieve these objectives by attending informational seminars, where he would endorse the initiatives. The CO also attended implementation team meetings regularly.

His vision is to allow Sailors to concentrate on their operational responsibilities, and to reduce their administrative burdens. He offered strong personal support to any initiatives that seemed likely to further that vision. He personally approved each initiative that was implemented, but his support did not end with decision endorsement. As described above, the CO provided a highly visible and supportive presence throughout the implementation process. The CO had a subsidiary, but still important goal, to eventually reduce manning requirements by improving the efficiency of work processes on the base.

NAS Brunswick began a partnership with the Navy's Smart Base Project Office early in the CO's tenure. The CO's goals and vision were complementary with those of Smart Base, and the Smart Base Project Office provided funding to help NASB implement several initiatives. The CO stated that this partnership worked well because NASB was "willing to play," -- they realized that the installation could and should operate more efficiently, and were ready to implement necessary changes. The CO emphasized that NASB was "willing to take risks." They realized that all of the initiatives might not be implemented successfully. He acknowledged that implementing organizational change at a large installation is a complex undertaking, and fully expected to encounter numerous impediments and occasional outright failures. Nevertheless, he believed that change was vital to ensure a successful future for the installation.

The CO presented several factors that he believed helped foster a successful work environment at NAS Brunswick. The base enjoyed good working relations with the labor unions. He began partnering with important stakeholders such as the unions and the local community early in his assignment as Commanding Officer. He also noted that he was the

senior Naval Officer in the state of Maine, and was commanding an installation with relatively few tenant commands (and no flag officers). He believed these factors gave him greater autonomy in running the base as he desired, including implementing substantial changes. The CO noted that the primary tenant commands stationed at NAS Brunswick were composed mainly of members of the P-3 Orion anti-submarine aircraft community. He mentioned that this community was very cohesive, and believed that this cohesiveness was a substantial factor in achieving consensus.

According to the CO, the largest stumbling blocks for implementing initiatives were a lack of monetary resources and skilled people. In particular, the base lacked personnel with backgrounds in computer programming and web page design. Although the necessary people could be hired, this would be an expensive proposition. The CO stated that an ongoing challenge was to develop the necessary computer skills in personnel assigned to the base. He expressed that the installation was substantially underfunded, and that it was an immense challenge to maintain morale with extremely tight budgets.

The CO had several recommendations for other installations attempting to implement organizational change. He stressed the necessity for partnering with the local community and other powerful stakeholders (such as labor unions). He stated that if the intent of the organizational change is to allow operational personnel to do their jobs more effectively or efficiently, and this intent is made clear to all stakeholders, it is easier to obtain buy-in. One impediment to any change effort is a lack of resources. Adequate resources (monetary and personnel) must be committed and sustained if substantial change is to be successfully implemented.

a. Analysis of the CO's Data

Many of the ideas expressed by the CO were identified as essential to implementing change throughout the change management literature. The CO recognized a clear need for change shortly after arriving at NAS Brunswick. He developed a clear vision of the desired future state of the installation (he envisioned an organization with a modern IT infrastructure that would reduce the administrative burden of assigned personnel), and successfully communicated this vision to the base's stakeholders. The CO identified who the key change agents would be (IT Department managers, Supply Officer, and other Department Heads) and instructed them to search for solutions that would help the installation realize its new vision. The CO's vision was clear and easily understood, and data obtained from interviews indicated it quickly became popular with personnel at all levels in the organization.

The CO also followed Beer et al.'s (1990) recommendation that leaders support bottom-up innovations. The Department Heads proposed implementing several initiatives they felt would help NAS Brunswick to realize its new vision. The CO carefully considered each proposal and approved those he felt were closely aligned with the vision and could be implemented successfully. Several of the factors he considered as he made the implementation decision are discussed in the change management literature. For example, Van de Ven (1993) emphasized the importance of allocating sufficient resources for innovation. The CO recognized the need to procure and allocate the necessary resources to implement the Smart Base initiatives. He partnered with the Smart Base Project Office to provide funding for several initiatives, to assure essential resources.

Beckhard and Pritchard (1992), Beer et al. (1990), and Zell (1997) stress the need for top leaders to make a personal investment to develop and build commitment for new initiatives. Beer et al. (1990) state that a shared vision is critical to successfully implementing change. They insist that developing a vision is not enough – strong leadership from the top is crucial to implement the changes needed to realize that vision. The CO was closely involved throughout the implementation process of the Smart Base initiatives. He demonstrated his commitment to each initiative repeatedly – in Department Head meetings, implementation team meetings, and at informational seminars and demonstrations.

2. IT Director's Perspective

NAS Brunswick's Information Technology (IT) Director was responsible for overseeing implementation of all three initiatives considered in this study. The IT Director reports directly to the Commanding Officer, and concurred that the Smart Base initiatives had been generally successful, with some setbacks. His assessment is based on meetings with the managers of each initiative, users of the technology, and personal observations. He identified three major factors that contributed to successful implementation. The first was strong leadership from the Commanding Officer. The IT Director stated that the CO personally approved all initiatives prior to their implementation, and was a strong champion for each initiative throughout the implementation process. The IT Director stated that the CO expressed his support for the initiatives verbally at weekly Department Head meetings, at implementation team meetings, and at informational seminars presented to potential users.

The IT Director believed that the second major success factor was the close working relationship the base enjoyed with its tenant commands. Early in the planning phase, the base

formed an "IT working group." This working group consisted of approximately 20 representatives from the base, its tenant commands, and other installations in the Northeast Region. The personnel participating in the working group included civilians, and Navy officer and enlisted members.

The third major success factor identified by the IT Director was partnering with the local community. He noted that several area schools had been linked together using equipment provided by the local cable television service. After studying this arrangement, NAS Brunswick also utilized the television company's assets (by leasing cable lines that were already in place) to improve connectivity on the base and to establish a base-wide intranet.

NAS Brunswick's IT Director also identified several stumbling blocks that were encountered as various initiatives were pursued. He stated that one of the most substantial problems on the base was undermanning. As a result, he believed that less than the optimal number of people were available to supervise change efforts and to assist in their implementation. On a positive note, he said the manning shortage made people eager to accept changes that would likely reduce their workloads.

The IT Director believed that insufficient planning had been done on some initiatives. Managers did not always know enough about the problems and proposed solutions, and this sometimes led to unexpected costs in terms of dollars and manpower. For instance, the IT manager implementing Jetform underestimated the difficulty and extent of programming needed to support the automated special request chit. As a result, the initial projected cost of the implementation effort proved to be much lower than later estimates.

The IT Director indicated that top leadership's role was to show initiative and solicit ideas from their people. The IT Working Group, which was composed of civilians, enlisted personnel, and officers from several military commands, was designed to foster an environment with diverse views and ideas. The IT Director indicated that promising ideas and solutions were investigated thoroughly, and leaders conducted detailed planning before they attempted to implement initiatives. He stated that key elements of initial planning were defining roles of participants in the implementation effort and identifying costs and funding sources. Managers attempted to anticipate unexpected costs that were likely to arise during the implementation process. An implementation decision and plan was not made until after the completion of this crucial early planning.

a. Analysis of the IT Director's Data

The three major factors that the IT Director identified as attributing to NAS Brunswick's successful implementation of several Smart Base initiatives all figure prominently in the change management literature. The first of these factors was strong commitment from the Commanding Officer. Several authors of change management literature assert that the commitment of the organization's top leaders is essential to successfully implementing change (Beckhard & Pritchard, 1992; Kaplan & Norton, 1996; and Van de Ven, 1993.) It is easier to obtain commitment from people at lower levels in the organization if they perceive their leaders are fully committed to the change effort, and are willing to provide support and necessary resources to implementors. The second success factor identified by the IT Director was fostering close working relationships with tenant

commands. This relationship promoted trust between NAS Brunswick's leadership and its stakeholders, and trust is an important element in building commitment (Zell, 1997.)

The third success factor discussed by the IT Director was partnering with the local community. The base and the local community worked together to develop initiatives that were mutually beneficial. This partnering helped NAS Brunswick to establish the infrastructure that was needed to implement several of the Smart Base initiatives, and helped build a closer relationship between the local community and the installation. As Beckhard and Harris (1987) note, the community around an organization is becoming an increasingly important stakeholder.

Several other elements of the data provided by the IT Director allude to characteristics discussed in the change management literature. For example, the IT Director recognized the importance of thorough planning, and felt that inadequate planning was largely responsible for the failure of the Jetform initiative. Specifically, the planners did not realize the complexity of the project, and failed to anticipate the setbacks that occurred. Beckhard and Pritchard (1992) agree that a well thought-out change plan is critical. Van de Ven (1993) stated that setbacks frequently occur during the innovation process, and that these setbacks often occur when unanticipated events happen. The IT Director acknowledged that setbacks were frequently encountered, and these unanticipated setbacks eventually led to the cancellation of the Jetform initiative.

3. Small Procurement Electronic Data Interchange (SPEDI)

a. NAS Brunswick

NAS Brunswick's Supply Officer first learned of SPEDI from the Supply Officer of another installation. He viewed a promotional videotape produced by Naval Air Warfare Center (NAWC) China Lake, the Navy's coordinator for SPEDI. The Supply Officer discussed SPEDI with representatives from NAS China Lake and Supply Officers of installations which had already implemented SPEDI. The Supply Officer and his deputy then selected one of their workers to serve as the training officer and site monitor for SPEDI at NAS Brunswick. The Supply Officer presented the Commanding Officer with details of SPEDI, and outlined the expected benefits of implementing the initiative at Brunswick. The Commanding Officer then approved the implementation plan. The Supply Department managers concentrated on getting "buy-in" from key internal and external stakeholders. They informed the Defense Finance Accounting Service (DFAS) branches at Norfolk, Virginia and San Diego, California and regional contracting officers of their plan to implement SPEDI, and obtained necessary administrative support from these commands. The Deputy Supply Officer stated that he had used ideas from a book on managing change, *Business as Unusual: The Handbook for Managing and Supervising Organizational Change*, (Pritchett & Pound, 1990), to "help bring people aboard" for the change effort. The ideas that he found most helpful were to keep a positive attitude, establish clear priorities, improve communication between himself and his workers, and the importance of creating a supportive work environment (Pritchett & Pound, 1990.)

The employee who had been chosen by the Supply Department managers to train users and serve as the site monitor was sent to NAWC China Lake to receive training and instructional materials. The managers had chosen an employee who was experienced,

well-respected by co-workers, and eager to take on new responsibilities. This person appeared to be highly motivated. The site monitor believed she was selected because she "could be relied upon to get the job done right".

NAS Brunswick's Supply Officer and Deputy Supply Officer realized that many of the base's potential SPEDI users were not familiar with personal computers or internet browsing, and that SPEDI's web-based interface was not especially user friendly. They addressed this problem by having the training officer conduct classroom training on how to use the system for all interested users. They also established a "help desk" occupied by the training officer, who answered telephone questions and visited work groups as needed to solve SPEDI related problems.

The Supply Officer and Deputy Supply Officer also presented the promotional videotape at a meeting of representatives from the installation's tenant commands, and gave specific details about how SPEDI would help simplify their supply ordering process. They stated that they had little power to force or coerce tenant commands to use SPEDI, so they believed that any attempt to "issue edicts" would not succeed.

NAS Brunswick's Supply Department Officer and his deputy stated that the implementation effort was hampered by several factors. Initially, only one vendor was available, and this vendor only stocked common office supplies. Selection was somewhat limited as a result. The Supply Officer and his deputy planned to eventually add several other vendors in an attempt to increase the numbers and types of products available online. They also experienced some payment problems from DFAS. These problems were relatively minor, and were settled within a few days. Many of these problems were typical of

bureaucracies – the DFAS representatives who had been informed of NAS Brunswick's plan to implement SPEDI had not passed this information to all of the clerks who processed payment transactions from NAS Brunswick. This problem was resolved by additional telephone calls to DFAS by Supply Department managers at NAS Brunswick.

Some potential users were reluctant to use SPEDI, and preferred to purchase their office supplies in the local community using government credit cards. The managers attributed this to two reasons: the limited selection available online, and the tendency of some work center employees to "enjoy getting off base and going shopping."

The Supply Officer was responsible for implementing the SPEDI initiative at NAS Brunswick. He believes that the initiative will eventually prove successful, but noted that several problems have developed. He received verbal and written feedback on the status of the implementation from two key assistants, the Deputy Supply Officer and the "site monitor." The site monitor was an administrative assistant tasked with training new users, issuing passwords to control access to the system, and manning a help desk.

The Deputy Supply Officer, also involved in the implementation of SPEDI at NAS Brunswick, believes that the initiative has been relatively successful, and will continue to be successful in the future. He stated that several factors helped to create success. Top management focused on "selling their people" on the advantages of SPEDI, while not "giving people a snowjob." In other words, the Supply Officer and his deputy attempted to present all of the potential advantages of using SPEDI, while acknowledging and addressing problems or drawbacks associated with use of the initiative.

The Deputy Supply Officer believed that accentuating the novelty of the innovation was effective because "our people want to try new things." In the implementation process, he had presented several advantages of SPEDI to potential users and their supervisors. Supplies ordered using SPEDI are entered into desktop computers, and lists of ordered items are emailed to purchasing officials. This eliminates much of the effort associated with compiling purchase lists (and the almost inevitable failure to contact everyone who needs to make a purchase). In addition, work centers that use SPEDI no longer have to procure a vehicle and send people into the local community to shop for the needed items. SPEDI contractors deliver ordered items to the base within two days (next day service is available if needed).

The Supply Officer and his deputy attempted to alleviate a major concern of their employees – the effect on their employment situation. They assured Supply Department employees that no one would be fired as a result of implementing SPEDI. They stated that they would "shift, not eliminate" jobs. The installation had already experienced some downsizing. As a result, many people felt overworked. Gains in efficiency and productivity would allow these people to concentrate more attention on their other responsibilities. Eventually, however, three positions were eliminated. The Supply Department found new jobs (at equal or increased salaries) for all three personnel. For instance, one man had been interested in joining the base security force for several years, and happily accepted a job as a security officer.

b. Portsmouth Naval Shipyard

The Supply Department officer who was responsible for implementing SPEDI at the Portsmouth Naval Shipyard (PNSY) in Kittery, Maine was also interviewed. He believes that the SPEDI initiative at PNSY has been relatively successful, although a number of difficulties were encountered during the implementation process. Like NAS Brunswick, he learned of SPEDI from a source outside the base. He also viewed the promotional videotape produced by NAWC China Lake, CA. PNSY's Supply Department officer believed that SPEDI would provide numerous benefits and would result in a "win-win" situation for both the installation and the vendor. He made the decision to implement SPEDI himself, and then worked to get early buy-in from key players (such as the Supply Officer and other Supply Department managers, Commanding Officer, and other Department Heads.) He quickly achieved top-down support for the initiative from his Commanding Officer. The Supply Department officer believed that many of the products offered by the vendor were priced below the General Services Administration (GSA) prices for items carried in the Supply Department's shop store. In addition, the shop store had to include a markup to cover overhead costs. Thus, as a result of SPEDI, the Supply Department officer hoped to eventually eliminate an entire shop store and at least 2 full-time equivalents (FTEs). This would reduce infrastructure costs by approximately \$100 k annually. In addition, the vendor promised prompt delivery (usually the next business day). Although this was one day longer than it would take to purchase items from a shop store, the Supply Department officer felt this delivery period was reasonable and acceptable to most users. The PNSY Supply Department officer felt that SPEDI would save money and time, and provide his customers with better service.

Like his counterparts at NAS Brunswick, the PNSY Supply Department officer assigned a "site monitor" to train users on SPEDI, issue passwords controlling access to the system, and provide assistance to users as needed. The site monitors from NAS Brunswick and PNSY traveled to NAWC China Lake together to receive training for their new roles.

The PNSY Supply Department officer used a marketing campaign to inform potential users about the initiative. He placed notices and information about SPEDI in the base newspaper and intranet, as well as on the Supply Department's website. He also explained the initiative to the installation's Leadership Council, which was composed of top managers from various departments on the base. The Supply Department officer also sent e-mails explaining the initiative to everyone on the base.

The PNSY Supply Department officer noted that many potential users initially demonstrated resistance toward the initiative. Several hundred workers had been laid off from the shipyard over the last few years, and many of the remaining workers were suspicious of any new initiative that promised greater efficiency – they felt that this would lead to even more layoffs. Additionally, many of the base's workers were not familiar or comfortable with using computers, and the comptrollers were not eager to add another payment system to their already heavy workload. Once SPEDI was implemented and working well, the PNSY Supply Department officer closed the base ship store that sold office supplies. He estimated that this decision saved PNSY \$100 k per year in labor costs alone. Although this action encouraged more work centers to use SPEDI, many work centers simply purchased their office supplies from local vendors using government credit cards. The Supply Department officer attributed this to the somewhat limited selection of products carried by the SPEDI vendor (not all

desired products were carried), as well as the previously mentioned resistance to using computers.

The Supply Department managers responded by sending e-mails to credit card users and their supervisors. The e-mails explained that credit card usage was more expensive to the base than ordering by SPEDI. The base had to pay a surcharge every time the government credit cards were used. In addition, the cost of processing the paperwork needed to document credit card transactions was higher than processing SPEDI transactions. Finally, the e-mail reminded supervisors of the productivity that would be lost if workers continued to leave the base to purchase office supplies. The e-mail also reminded supervisors and potential SPEDI users that training was available at their convenience, and listed the number for the SPEDI help desk. The PNSY Supply Department officer noted that use of SPEDI had increased after his latest e-mail, and the number of credit card transactions had decreased. His assistant conducted training for several new users, and the new ordering system seemed to be gaining wider acceptance. He stated that his next task was to add new vendors. Users had told him and his assistant that they would use SPEDI more frequently if a wider selection of products were available online.

c. Analysis of Implementation at NAS Brunswick

Several facets of the implementation process used by the Supply Department managers at NAS Brunswick have been discussed by change management authors. The implementation process followed several stages described in Van de Ven's work (1993). The Supply Officer learned of the existence of SPEDI, and NAWC China Lake's marketing efforts aroused his interest. He was persuaded that the idea had merit, and convinced the

Commanding Officer to support the initiative and approve its implementation. Several characteristics described by Rogers (1983) appealed to leaders at NAS Brunswick. SPEDI addressed a significant problem the installation faced (how to procure office supplies more efficiently.) Several of the innovation's characteristics suited the installation: SPEDI had a strong relative advantage over traditional procurement methods (it allowed items to be procured less expensively.) SPEDI was also highly compatible with the goals of the Supply Department, since it would reduce costs while maintaining adequate service to customers. The complexity of the initiative was relatively low – the software was web-based, and was maintained and updated by another installation (NAWC China Lake, CA). SPEDI had two other characteristics described by Rogers (1983.) It had high “trialability” and “observability.” SPEDI was initiated on a trial basis with a single vendor and a limited set of supplies (common office supplies). Based on several usage data (number of orders submitted, delivery time for orders, percentage of potential customers who actually used SPEDI) the viability was confirmed and the initiative was fully implemented.

As Beckhard and Pritchard (1992) suggest, the managers provided education and training about the initiative to all interested personnel. NAS Brunswick's Supply Department managers also demonstrated personal commitment to SPEDI (Beckhard & Pritchard, 1992; Beer et al., 1990.) Zell (1997) states that trust must be established to obtain commitment from employees. He asserts that employees must feel they will be treated fairly, and must share in information affecting their jobs and futures. The Supply Department managers addressed this concern by assuring their people that no one would be fired (or

subjected to a pay cut), and by helping affected personnel find new roles or positions within the organization.

d. Analysis of Implementation at the Portsmouth Naval Shipyard

A single officer supplied all of the data concerning how SPEDI was implemented at the Portsmouth Naval Shipyard. Although this is a significant limitation, the interview confirmed that many of the same elements discussed in the analysis of NAS Brunswick's implementation of SPEDI also apply to SPEDI's implementation at Portsmouth. The Supply Department officer at Portsmouth Naval Shipyard learned of the existence of SPEDI from an external source, and was convinced that implementing SPEDI would provide strong benefits to the Supply Department. The implementation plan paralleled that of NAS Brunswick's in many respects (the site monitors for the two installations even attended training courses on the initiative together). Some differences did exist, however. For instance, the Supply Officer and his deputy were both personally involved in implementing SPEDI at NAS Brunswick. The officer responsible for implementing SPEDI at the Portsmouth Naval Shipyard was in the middle echelon of management (neither the Supply Officer nor his deputy at the Portsmouth Naval Shipyard were actively involved in the implementation of the initiative.) This suggests that at least one initiative that was implemented at the Portsmouth Naval Shipyard did not benefit from as high a level of visible support from top leadership as an identical initiative at NAS Brunswick. Change literature suggests that without such leadership support, Portsmouth Naval Shipyard may experience increased difficulty in implementing more complex initiatives.

Another significant difference in the implementation approach used by the two installations was how affected people in the Supply Department were treated by management. Supply Department managers at NAS Brunswick promised their subordinates that no one would be fired as a result of productivity gains. This promise may have helped to develop trust between managers and employees and increased commitment for successfully implementing SPEDI, but it limited the potential savings that could be achieved by eliminating positions. No such promise was made by managers at the Portsmouth Naval Shipyard. Long-term follow up on the outcomes of these two strategies could prove insightful as to the trade-off between increased cost savings through personnel reductions and maintaining personnel commitment.

4. Docushare

a. Implementation Data

The manager responsible for implementing Docushare at NAS Brunswick said that the initiative had been successfully implemented. He was the Information Technology (IT) Director at NAS Brunswick when the decision was made to implement Docushare. He stated that the Commanding Officer was seeking a way to improve how the installation's instructions were maintained and updated. The IT manager examined several commercially available software packages that had the capability to store and display these directives. He also researched the hardware requirements needed to support the software, and developed cost estimates. When this preliminary work was done, he presented his results to the base's Commanding Officer. He recommended that NAS Brunswick utilize the Xerox Corporation's Docushare software package. The IT manager informed the CO that the software was easy to

install, and could be installed quickly with a low time investment on the part of IT personnel. Only one person outside the IT Department would be needed to help place the instructions online. This employee would be tasked with scanning the documents into the Docushare software. Because the software is also web-based, all of the instructions could be placed on a server, and anyone who had access to the base's intranet could access instructions as needed. Password protection could be used to limit access to sensitive information. The manager stated that the Commanding Officer quickly endorsed his recommendations, and the manager began implementing his plan.

The first step of his implementation plan had been to ensure that he thoroughly understood the requirements. The manager first studied the existing process of updating and distributing instructions. He said "automating a bad process" was a poor solution, and that several steps had to be taken to prevent this from occurring. The IT manager first defined and analyzed the current process. During this stage, the current process was mapped, shortcomings were identified, and potential improvements were considered. For example, one shortcoming of the paperbound system was the delay experienced in printing and distributing revised instructions. The automated system would solve this shortcoming – the most current version of an instruction would be immediately available to all users once it was posted on the base's intranet.

Once the process was clearly understood and consensus (among the IT Department managers, administrative personnel, and the CO) was obtained on necessary changes to improve the current process, IT Department managers examined software available to help automate the process. The IT manager used a lab to run several alternative software

packages to see which one best fit the needs of the command. Once a software package was selected, the decision to assign personnel to implement it followed. NAS Brunswick had one central files clerk who maintained and distributed base instructions. The IT manager decided this was the person best suited to scan the documents into the software package. The Commanding Officer concurred, and the clerk was instructed to assist IT personnel in implementing Docushare.

After several instructions were posted on the base's intranet, the IT managers presented a Docushare demonstration to approximately 30 personnel. The purpose of the briefing was to market Docushare and obtain buy-in from key managers on the base. Attendees included NAS Brunswick's Commanding Officer, a representative from the Air Wing, the Commanding Officers of the squadrons based at NAS Brunswick, and representatives from several tenant commands. The manager's goal was to present an "electronic library" to these personnel. A personal computer was connected to a large viewing screen, so that attendees could see the actual web pages during the demonstration. The IT manager thoroughly briefed the Commanding Officer before the demonstration, and they agreed that the CO would interrupt the presentation with questions and comments about several aspects of the initiative. This technique was selected to demonstrate the CO's support of the initiative to the audience, and to stimulate questions that might not have been asked by others.

At the meeting, the IT manager presented an overview of the initiative, explained why NAS Brunswick decided to implement Docushare, including how the change would affect the audience. He stated that user accessibility would be improved (users would

no longer have to search for the one or two copies of an instruction allocated to their workcenter), and users would no longer have to worry about whether they had the most current version of an instruction. In addition, users of the instructions would no longer face the administrative burden of inserting changes in paper documents. He connected to several websites on the base's intranet to demonstrate the capabilities of the software package. He introduced the package as a key component of "your electronic library". He explained how the information was arranged, showed the audience each website, and encouraged the audience to ask questions. Several questions did arise, including some issues that the CO introduced. The planned CO questions technique appeared to work well. All questions were answered, and the audience was given contact information for any future assistance that they or other personnel might need.

The IT manager recommended that the Docushare package be implemented at other installations. He noted that it was easy to install, and improved access to instructions for all personnel. He attributed the initiative's success at NAS Brunswick to the following key areas: thorough research of the original process (so that technical requirements were clearly understood), clear assignment of responsibilities for each implementation task, and strong, visible support from the Commanding Officer (which helped to achieve buy-in from other base personnel).

b. Analysis of Implementation

The implementation of Docushare included several elements that are discussed extensively in change management literature. Van de Ven (1993) and Rogers (1983) discuss the value of being able to implement an initiative on a small scale. Only a few documents at a

time were converted to electronic format and posted on the base intranet. In addition, the old paperbound system was not entirely eradicated – a master paper copy of all documents is still filed, in case the electronic version is somehow damaged. Several of the characteristics of innovations described by Rogers (1983) were present in the Docushare initiative. For instance, Docushare addressed a need or problem experienced throughout the base (personnel needed ready access to the most current directives.) After the initiative was developed, IT managers fostered its adoption by using several elements described by Rogers (1983). They conducted a marketing campaign (composed of informational seminars promoting the initiative), and distributed the technology to potential users by placing the most commonly used instructions on the base intranet before converting less frequently used instructions into electronic format.

In addition, the Docushare initiative possessed several factors that Rogers (1983) described as critical to ensuring timely adoption by users. Docushare had a strong relative advantage over the old system of printing and distributing paper documents. The installation was able to reduce expenditures on paper, ink, storage, and distribution, and users were able to instantly access the latest version of directives. Docushare was highly compatible with the existing process – users would simply view the pages on their computer screen instead of in paper format, and still had the option of printing paper copies if they desired. The Docushare initiative was not too complex – the necessary software was easily installed, and less than thirty minutes were required to train a filing clerk how to scan paper documents into electronic format. Docushare also had high “trialability” and “observability”. Van de Ven (1993) notes that receptiveness to an innovation increases when an initiative that

is developed elsewhere can be tailored to the local organization. Docushare was tailored to fit the needs of NAS Brunswick by the base's own IT personnel.

Beckhard and Pritchard (1992) emphasize the importance of a well thought-out change plan and support from top leadership, two elements that were clearly present in the implementation of Docushare. Beckhard and Harris (1987) emphasize that an implementation plan should be clearly defined in as detailed a manner as possible, and this advice was followed during NAS Brunswick's implementation of Docushare.

5. Jetform

a. Implementation Data

The IT manager who initiated implementation of Docushare also initiated NAS Brunswick's Jetform initiative. The manager first learned of Smart Base's "paperless admin" initiative from a representative of the Smart Base Project Office. This representative informed him that the initiative's goal was to help reduce the administrative burden on installation leaders and managers by routing common documents throughout the command electronically. It was hoped that this automated process would be more efficient (avoiding routing delays inherent in moving paperwork around a large installation) and would provide better visibility of the status and location of paperwork. The IT manager studied the commercial software applications available from twelve vendors, then visited the Smart Base Project Office to see demonstrations of the three most promising software packages. The IT manager and two Smart Base team members reached consensus on utilizing Jetform. This software package would require extensive programming for each form that was automated, but Smart Base personnel felt this effort would only need to be done once – the final product

could be copied by other installations. The IT manager and Smart Base personnel selected the Special Request Chit to demonstrate the technology. They felt this was a common, relatively simple, and useful form to automate. NAS Brunswick's Commanding Officer agreed, and the Smart Base Project Office agreed to help fund the Jetform implementation effort.

The implementation team (composed of NAS Brunswick's Administrative Officer, who was familiar with the complete paper process, and IT Department personnel) began by mapping the process. Since the Jetform programmer would have to write computer code to direct the routing of the request chit, each decision point had to be identified. Programming rules had to be developed for each decision point. The rules prevent people at lower levels in the organization from disapproving a request without forwarding the request up the chain of command (complying with Navy rules concerning request chits). The rules also determine how long a request is allowed to remain in any one manager's electronic in-box before being automatically forwarded to the next higher level in the organization. The IT manager had misgivings about the complexity of the initiative at this point. A process that had initially seemed to be relatively straightforward was rapidly proving to be quite intricate.

When the implementation team felt that the process had been thoroughly mapped, the computer programmer wrote the code to support the special request chit's routing. After the code was completed, IT personnel submitted several dummy chits to test the software. It became apparent that the process had not been thoroughly mapped and appropriately coded because the implementation team was unable to successfully route a chit to the Commanding Officer. IT personnel reviewed the process decision points and rules to identify deficiencies. After numerous hours of troubleshooting, some problems were

identified and corrected, but they were still unable to route a Special Request Chit throughout the chain of command.

Naval Station Pascagoula, Mississippi had also been attempting to automate forms using the Jetform software. The IT manager flew to Mississippi to observe their efforts and exchange ideas about how to solve the routing problem. He concluded that successful implementation was unlikely. He presented several reasons for this assessment to Smart Base personnel, the IT Director, and the Commanding Officer. The major obstacle was the complexity of the programming task. NAS Brunswick has several thousand employees. Many of these employees have numerous people in their chains of command who had approval authority for special request chits. To further complicate matters, new personnel are constantly arriving, and other personnel are detaching. These variables made it nearly impossible to correctly identify all of the decision points necessary to route a special request chit from any one service member to the appropriate approving authority.

The IT manager also emphasized that the expected benefit of successful implementation, automatic routing of special request chits, was not worth the additional cost (in terms of money and time) that would be required to further pursue the initiative. The IT Director, Commanding Officer, and Smart Base personnel had been kept informed of progress and difficulties throughout the implementation effort, and concurred with the IT manager's assessment. The IT manager emphasized that much had been learned, and Jetform should prove useful in automating simpler processes with fewer decision points. He recommended exploring alternatives such as using Jetform to help track unfunded budget items. He stated

that Jetform had the potential to provide accurate and timely information to managers about more streamlined processes.

The IT manager believed that the failure of the Jetform initiative could be attributed to an insufficient understanding of the complexity of the process, and the requirements generated by that process. He said he did not initially realize how many decision points and rules applied to the request chit process. He stressed that other installations could avoid this type of failure by ensuring that the process is well mapped and clearly understood before other actions are taken. He also used the experience he acquired about the software package to determine suitability for other applications that had not been previously considered.

b. Analysis of Implementation

Some of the problems that may have contributed to the failure of the Jetform initiative are identified in change management literature. Several of the factors that Rogers (1983) identifies as predictors of the rate of adoption of innovations were also observed in the implementation process for the Jetform initiative. The initiative promised a strong relative advantage over the existing system of routing paper Special Request Chits. However, the automated process was extremely complex and was highly incompatible with the traditional paper process.

Rogers (1983) and Van de Ven (1993) often refer to complexity as an impediment to successful change implementation. They explain that the chances of successful change implementation decrease as the complexity of the innovation increases. To emulate the paper process, the technological development of the Jetform initiative was required to be

complex. Rogers (1983) insists that innovations that are highly complex and incompatible with existing practices are less likely to be successfully adopted. Van de Ven (1993) agrees with Rogers – he states that the chances of successfully implementing an innovation decrease with the novelty, size, and temporal duration of the initiative. Beckhard and Pritchard (1992) and Beckhard and Harris (1987) emphasize that implementation tasks must be clearly identified and defined. IT managers identified the tasks that were needed to implement Jetform, but underestimated the difficulties and resources required to complete the tasks. As a result, the expenditure of resources devoted to implementing Jetform (in terms of manpower needed to program the decision rules) quickly exceeded initial projections. The programming difficulties mounted, and the implementation team felt that the only way to solve the problems was to seek the assistance of outside professional programmers (which would be an expensive solution.)

Ultimately, the trial effort proved unsuccessful. NAS Brunswick's Commanding Officer, IT Department Managers, and Smart Base Project Office team members agreed that the potential benefits of implementing Jetform were not justified by the anticipated high costs of further development efforts. As a result, the outcome followed the course predicted by Rogers and Van de Ven for innovations with unsuccessful trials, i.e., it was rejected. Van de Ven (1993) stresses that management can never ensure that innovations are successfully implemented, but can only improve its odds. Kanter, Stein, and Jick (1992, p.370) further assert that "...change is extraordinarily difficult, and the fact that it occurs successfully at all is something of a miracle...."

It is worthwhile noting that NAS Brunswick's CO, IT managers, and the Smart Base Project Office team members did not become unduly discouraged by the failure to successfully implement Jetform. Indeed, the CO and IT Director stated that they expected some of the initiatives to fail. The implementation team instead focused on analyzing the reasons for failure so that lessons learned could be applied to future change efforts.

6. Summary

The data gathered from NAS Brunswick and the Portsmouth Naval shipyard suggest that many of the elements which the change management literature identifies as critical to successfully implementing change were present in the initiatives. These elements include the importance of having a shared vision, the necessity of obtaining commitment from top leadership, the need to achieve buy-in from key stakeholders, and the importance of thorough planning (this includes the need to clearly define implementation tasks, managing resistance to change, and managing setbacks).

The importance of a shared vision was clearly recognized by the leaders who implemented the Smart Base initiatives at NAS Brunswick. The CO had a clear picture of the desired future state of the organization (he envisioned a technologically modern IT infrastructure that would permit base personnel to concentrate more attention on their operational responsibilities, and allow them to spend less time on administrative tasks), and supported change initiatives that were aligned with his vision. The IT managers responsible for implementing Docushare and Jetform and the Supply Department officers involved in implementing SPEDI shared the vision.

Leaders at NAS Brunswick worked to clearly communicate this vision throughout the organization. The CO and leaders of the implementation efforts for the initiatives communicated the vision verbally at meetings, and also placed the vision statement on the base's intranet web page. However, NAS Brunswick's leaders communicated their commitment to the vision most effectively by implementing several Smart Base initiatives designed to ease the administrative burdens faced by Sailors. Implementation leaders marketed the initiatives vigorously and emphasized the benefits that each initiative would have for users. This helped build support for the new vision among personnel at lower levels in the organization.

Several authors of change management literature assert that the commitment of the organization's top leaders is essential to successfully implementing change. All personnel interviewed (from both high and low levels in the organization) perceived the CO as being highly committed to the various Smart Base initiatives. The CO viewed the initiatives as a learning process – although he carefully evaluated proposed initiatives before endorsing their implementation plans, he realized the initiatives were experimental and that some would probably fail. The CO believed an innovative installation had to be willing to take risks, and he did not take punitive measures against implementation leaders when initiatives were not successfully implemented. When leaders at NAS Brunswick encountered failure, they simply concentrated on understanding why an initiative failed. They used this knowledge to improve the implementation plans for other innovations.

Commitment of a critical mass of stakeholders is not enough to successfully implement organizational change. Detailed planning and sufficient resources are equally important. The

Numerous change literature authors have asserted that resistance to change efforts should be expected, and managing this resistance is an important component of an implementation plan. Strong support from top leadership and the commitment of a critical mass of stakeholders can help reduce resistance to change efforts. Measures such as changing the organization's reward system, reallocating the roles and responsibilities of personnel, and maintaining open communication among the organization's members can also be used to help diminish resistance to change.

The change management literature also suggests that setbacks are commonly encountered during the implementation process. These setbacks can occur when plans go awry or when unanticipated events happen. Setbacks cannot be eliminated, but thorough planning can help reduce the chance of encountering unanticipated events. Van de Ven (1993) warns that setbacks can have serious consequences – they can provide opportunities for learning or can lead to termination of the change effort.

Evaluating and monitoring change efforts is necessary to ensure that the change effort is proceeding as planned, and to modify the plan if needed. Measurement and feedback should be used to determine the effectiveness of the change effort, and for managers to gain insight into both the positive and negative aspects of the change. An accurate evaluation of the effort is also needed to help leaders decide whether to adopt or cancel the initiative being implemented. Leaders at NAS Brunswick monitored the change efforts continuously throughout the implementation process, and held implementation team meetings as needed to modify plans. The leaders used several means of evaluating the change efforts, such as verbal

feedback from users, tracking usage (e.g., number of orders submitted using SPEDI), and analyzing surveys.

Finally, it is critical to institutionalize changes that have been made. The organization may have to change its personnel evaluation and reward systems to achieve a better fit with the changes that have been made. Many of the Smart Base initiatives are still being implemented at NAS Brunswick, and changes have not yet been institutionalized.

It is noteworthy that some of the elements the literature identifies as critical to successfully implementing change were not strongly evident in the initiatives observed. For example, Van de Ven (1993) states that moderately low personnel turnover is a critical factor in successfully implementing organizational change. Military organizations are typically subject to a relatively high personnel turnover rate, and NAS Brunswick is no exception. Although turnover occurred throughout the departments implementing the Smart Base initiatives, it did not appear to have a strong negative impact on the implementation process. A single Commanding Officer presided over the implementation of all the initiatives. Several personnel at NAS Brunswick expressed concern about the future of the further development of Smart Base initiatives after the current Commanding Officer leaves.

The change management literature also suggests that it is critical to build consensus and achieve buy-in. However, the clerk tasked with scanning the paper documents into Docushare was initially reluctant to participate in the implementation effort because he understood the old system well. He was comfortable with the old paper-intensive system, and did not initially concur with changing the process. The IT manager charged with implementing Docushare refused to debate the merits of Docushare with the clerk, and simply

informed the clerk what his new duties were. The IT manager was a retired Limited Duty Officer with several years' experience with technology implementation as an enlisted man. He stated that he believed that his experience and background gave him the credibility and personality needed to simply issue orders to people reluctant to participate in organizational change. The IT manager stated that the clerk eventually became a strong advocate for the new system, as he realized that it actually made his job easier. The clerk was interviewed, and confirmed that Docushare was much more efficient and easier to manage than the paper system. This supports Beer et al.'s contention (1990, p. 159) that the most effective way to change behavior is to "...put people into a new organizational context, which imposes new roles, responsibilities, and relationships on them..." Beer et al. (1990) suggest that this will "force" people to develop new attitudes and behaviors.

V. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

Three Smart Base initiatives undertaken at NAS Brunswick were examined - two were successful and one was abandoned.

Several factors fostered the successful implementation of the SPEDI and Docushare initiatives: strong leadership and personal commitment from the Commanding Officer throughout the implementation process, the CO's willingness to risk failure, partnering with key stakeholders, allocating sufficient resources to the change effort, a clear understanding of the problem to be solved, thorough planning of the solution addressing the problem, and promotional efforts to inform potential users about the benefits of Smart Base initiatives being implemented.

NAS Brunswick's Commanding Officer provided strong leadership throughout the implementation process.

He personally approved plans to implement each initiative, and frequently attended implementation team meetings and informational seminars designed to inform potential users about the benefits and advantages of each new Smart Base initiative. The CO added comments and suggestions throughout these meetings, which helped demonstrate his support for the change efforts to both the implementation teams and potential users of the initiatives. The CO carefully selected which initiatives were to be implemented at NAS Brunswick. He was most receptive to initiatives that seemed likely to reduce the administrative burden on

Sailors, thereby allowing them to concentrate more attention on their operational responsibilities.

The CO was willing to take risks.

He acknowledged that it is difficult to implement change in a large organization, and many of the Smart Base initiatives that he supported were experimental (successful implementation was uncertain.) If successfully implemented, the innovations appeared likely to help the installation operate more efficiently. The CO felt that the potential cost savings and efficiency gains that can be made by improving inefficient processes are worth the cost of occasional failures.

NAS Brunswick's leaders strived to partner and develop close working relationships with key stakeholders.

NAS Brunswick strives to partner with its tenant commands, the Smart Base Project Office, unions, and the local community. NAS Brunswick served as a testbed to demonstrate the technology for several Smart Base initiatives, and the Smart Base Project Office supplied funding to assist in the implementation of the initiatives. Partnering with key stakeholders helped reduce resistance to implementing change, often referred to as achieving "buy-in" from various managers.

Leaders at NAS Brunswick allocated sufficient resources to the Smart Base initiatives.

Necessary resources that were allocated to the initiatives included commitment and support from top leadership, assignment of skilled personnel to implementation teams, and funds to purchase needed equipment. Implementation leaders asserted that dedicating

sufficient resources to each initiative was an enormous challenge because operating budgets are tight and the base is undermanned.

Installation leaders initially focused on clearly understanding the problem.

Once they understood the problem, installation leaders then considered potential solutions to that problem. Existing process were studied, so that the new process could reduce or eliminate problem areas. As one manager at NAS Brunswick stated, "automating a bad process is a bad solution."

Thorough planning helped reduce the number of unanticipated costs that appeared during the implementation of Smart Base initiatives.

NAS Brunswick's leaders developed detailed implementation plans for each Smart Base initiative. These plans specified who would be assigned to implementation teams, what their roles and responsibilities would be, what resources would be allocated to the initiative, and how these resources would be obtained.

Failure to understand the complexity involved (programming logic) led to abandonment of the Jetform initiative.

Managers at NAS Brunswick believed the primary reason that Jetform failed was the existing process was not clearly understood. Consequently, managers did not anticipate the complexity and corresponding high developmental costs that implementing the initiative would require. The initiative would only provide the limited benefit of automating Special Request Chits. Managers eventually decided that this benefit was not worth additional expenditures, and cancelled the initiative.

Initiatives were marketed extensively.

Leaders at NAS Brunswick concentrated on informing potential users about the Smart Base initiatives that were being implemented. The initiatives were discussed at Base Department Head meetings, informational seminars were conducted, short statements describing the initiatives (and how they could benefit users) were placed in Plans of the Day, training on how to use the technological initiatives effectively was conducted, and "help desks" were provided for some initiatives. Although the initiatives that were implemented at NAS Brunswick originated in high levels of the organization (usually at the Department Head level), leaders devoted considerable effort to promoting the benefits of each initiative to people in lower levels of the organization.

B. RECOMMENDATIONS

Commanding Officers:

Obtain a detailed list of Smart Base initiatives to ascertain which ones are applicable, and could be studied and implemented at their base.

Department of the Navy:

Create a database accessible to all base COs summarizing and updating Lessons Learned concerning Smart Base initiatives being implemented.

Provide educational modules on conducting risk assessments and methods for managing risk, including relevant rewards and incentives.

Provide sufficient funding to extend implementation of applicable Smart Base initiatives to other bases.

C. SUMMARY OF INITIATIVE IMPLEMENTATION

Several elements which the change management literature identifies as critical to successfully implementing change were present in the initiatives. These elements include the importance of having a shared vision, the necessity of obtaining commitment from top leadership, the need to achieve buy-in from key stakeholders, and the importance of thorough planning.

Kaplan and Norton's *Balanced Scorecard* model (1996) emphasizes the importance of clarifying the vision of the organization's desired future state, communicating this vision to all members of the organization, and educating the organization's members about the vision. The first substage in the process of innovation diffusion and adoption described in Rogers's model (1983) is marketing and promoting to increase awareness of an innovation using a variety of communication channels. It is critical for leaders to have a clear vision of the desired end state after change has been implemented (Beckhard & Pritchard, 1992; Beckhard & Harris, 1987; and Beer et al., 1990.) NAS Brunswick leaders demonstrated that they incorporated these elements into all of the change efforts they participated in.

Of course, any attempt to implement organizational change begins with the assumption that the status quo is not optimal. Leaders must first clearly define the problem before they can consider solutions that will help move the organization toward a desired end state (Beckhard & Harris, 1987; Beckhard and Pritchard, 1992; and Beer, Eisenstat, & Spector, 1990.) Leaders at NAS Brunswick thoroughly analyzed the traditional processes of updating and distributing directives and office supply procurement before considering implementing Smart Base initiatives to improve the efficiency of these processes. They felt

that their examination of the Special Request Chit routing process was less thorough, and attributed this to be a major cause of the Jetform initiative's failure to be successfully implemented.

Two additional factors emergent from the literature on innovation and change are the necessity of building commitment throughout an organization and personal commitment from top leaders (Beer et al., 1990; Beckhard & Harris, 1987; Beckhard & Pritchard, 1992; and Zell, 1997.) The CO of NAS Brunswick and the senior leaders who directed the implementation of the Smart Base initiatives were personally and visibly committed to the success of the initiatives. These leaders demonstrated their commitment in several ways – by staying personally involved throughout the implementation process, by securing and allocating the necessary resources to each change effort (such as money, manpower, and the time of top leaders), attending implementation meetings, and by arranging demonstrations and training for interested users.

Several authors of change management literature (Rogers, 1983; Van de Ven, 1993; and Zell, 1997) note that implementing change in complex organizations is always difficult, and success is never assured. They state that setbacks frequently occur, and assert that the chances of successfully implementing an initiative decrease in large, complex organizations, and also decrease if the initiative is not highly compatible with existing practices, or requires a long time to implement. The SPEDI and Docushare initiatives were relatively simple, and were implemented relatively quickly. NAS Brunswick personnel were unable to implement the substantially more complex Jetform initiative.

Several factors that are identified by the change management literature as being crucial to successfully implementing innovations were not observed at NAS Brunswick. For example, Beer et al. (1990) suggest that change should not be pushed from the top. All of the Smart Base initiatives implemented at NAS Brunswick originated at a relatively high level (at Department Head level or higher), but there was no evidence that this complicated the implementation process. However, reliance on this approach may limit the long-term capability of the organization to pursue and accomplish innovation. This is suggested by those who stated that the future of innovations may not be maintained once the current CO leaves NAS Brunswick. This reinforces Beer et al.'s (1990) assertion that change must be institutionalized through formal policies, systems, and structures to ensure that the positive aspects of the effort continue after key people involved in implementing change leave the organization.

Van de Ven (1993) asserts that an organization's members are less receptive to adopting innovations that were developed outside of the organization, and are more receptive to locally developed innovations, although this effect is reduced if the innovation can be tailored to fit local situations. No evidence to support this assertion was found in the interviews conducted at NAS Brunswick.

Van de Ven (1993) states that moderately low personnel turnover is a necessary enabling condition to implementing change. NAS Brunswick (like most military installations) experiences relatively high personnel turnover, but has still managed to successfully implement several substantial innovations. Managers who participated in interviews to support this thesis stated that high turnover has forced them to constantly train

new people, but was more of an inconvenience than a serious impediment to implementing change.

D. SUGGESTED FURTHER STUDIES

This exploratory study has only begun to uncover the increasing body of knowledge on managing innovation and change in complex organizations. Further studies could focus on quantifying the benefits and costs of the Smart Base initiatives, examining to what extent organizational change becomes institutionalized at NAS Brunswick (will NAS Brunswick continue to be an innovative installation?), and how (and to what extent) initiatives that have been implemented at NAS Brunswick diffuse to other installations.

APPENDIX A. INTERVIEW QUESTIONS

1. How would you assess this initiative's success to date?
 - What are your indicators? (How did you measure success?)
 - How did you get there?
 - Are users satisfied with the product?
 - How do you know?
 - Did the initiative provide the benefits that you expected?
2. What were the major factors that have contributed to this success?
 - How did you identify critical stakeholders?(employees, unions, local officials)
 - How did you get "buy-in" from these stakeholders?
 - How did you get feedback from interested parties as the initiative was being implemented?
 - Who decided to implement the initiative?
 - Why did you decide to implement the initiative?
 - How was this decision made?
 - How was the implementation plan developed?
 - How long did planning take? Who was involved?
 - What characteristics were considered when choosing implementation team members?
 - If the initiative was not conceived locally, was the initiative or implementation modified to better fit NAS Brunswick's organizational goals?
 - What was the purpose or vision for this initiative? What were the expected benefits?
3. What stumbling blocks were encountered along the way and did you have to change any paradigms?
 - Had you anticipated these setbacks?
 - How did you solve these setbacks?
 - Did these solutions work well?
 - How do you know?
 - Did you encounter significant support for or resistance against this initiative?
 - How do you know?
 - Were changes to the implementation plan needed? If so, how were these changes made?
4. What have you learned as a change agent?
 - What advice do you have for others involved in implementing organizational change?

APPENDIX B. SMART BASE INITIATIVES AT NAS BRUNSWICK

1. Docushare – All base instructions and notices are converted to electronic format, and are posted on a base intranet. Eliminates the need to print, distribute, and add changes to paper documents, and improves accessibility to current directives. This initiative has been implemented.
2. Small Parts Electronic Data Interchange (SPEDI) – Permits office supplies to be ordered via internet. Eliminates the need to carry items in a store run by the installation's supply department, or to send personnel to purchase office supplies from vendors in the community. This initiative has been implemented.
3. Video Teleconferencing (VTC) – Transmits video images of conference participants with VTC equipment. Permits users to exchange more information (such as charts) than is available using traditional telephone conversations. This initiative has been implemented.
4. Distance Learning Classroom – VTC technology incorporated into classrooms. Room can be used to teach students at remote sites, or students can receive lessons transmitted from other locations. This initiative has been implemented.
5. Access Control – Uses technology (such as proximity cards) to operate gates to control access to sensitive areas. Reduces the number of human security personnel needed to control access. This initiative has been implemented at the Portsmouth Naval Shipyard, and is still in the development phase at NAS Brunswick.
6. Hazardous Substance Material System (HSMS) – Uses computer servers and databases to manage and track hazardous materials. Can provide firefighters with a detailed chart of the location and type of hazardous materials are stored in buildings on the base. This initiative is still being developed.
7. Public Works facilities management – Uses barcoding technology to manage to track and manage inventory. Also tracks labor and job costs, and allows trouble calls to be entered and tracked via the base intranet. This initiative is still being developed.
8. Presto – A software package would be used to transmit security clearance data directly to the Department of the Navy's Central Adjudication Facility (DONCAF). Also allows security managers to track the status of clearance submissions. This initiative was cancelled.
9. Jetform – Software would forward electronic forms throughout a command. NAS Brunswick attempted to automate Special Request Chits. Software would allow administrative personnel to track the status and location of requests. Built-in rules would

automatically forward the request up the chain of command if any supervisor in the chain of command was on leave. This initiative was cancelled at NAS Brunswick.

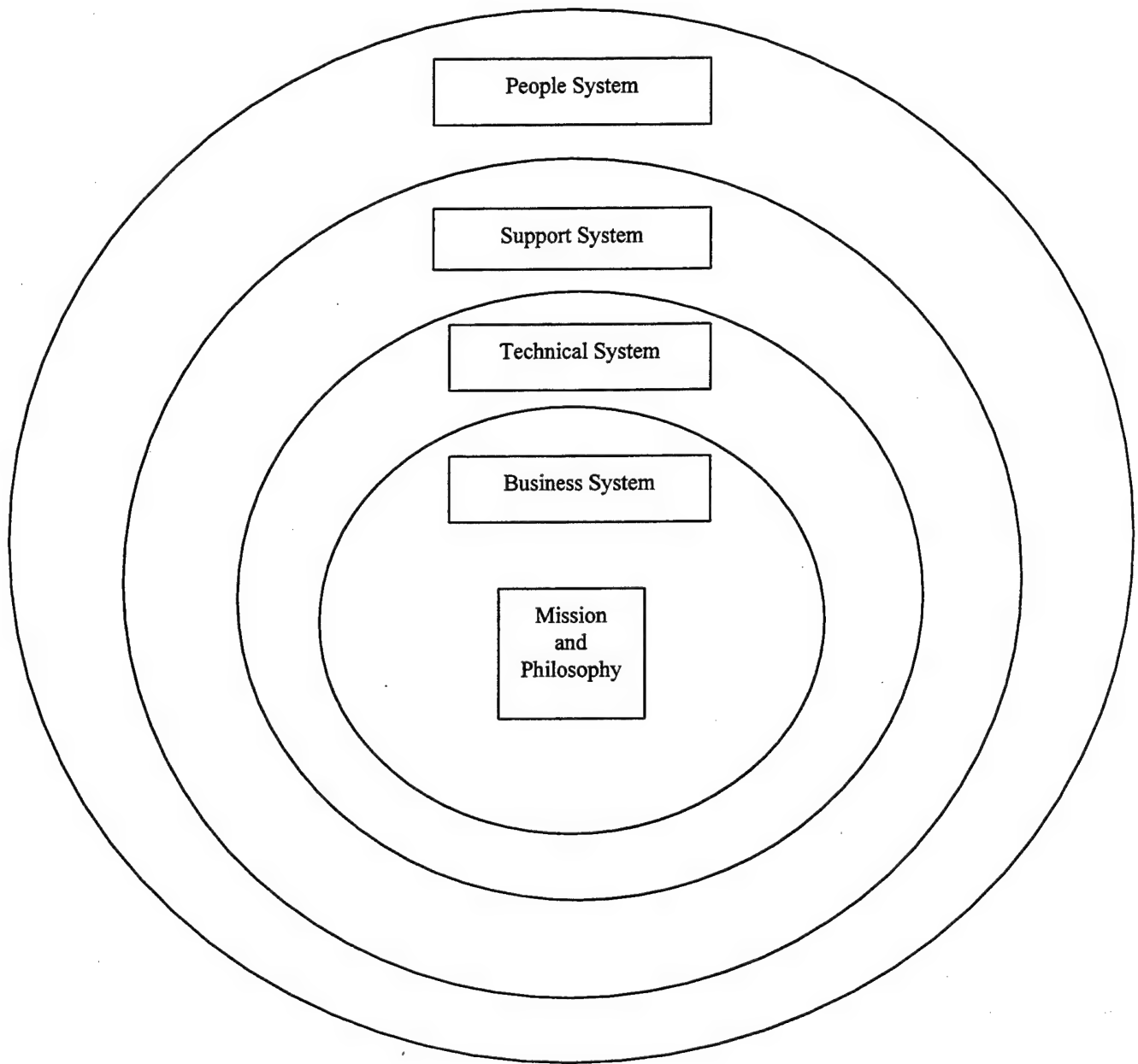


Figure 1. Zell's Bull's-Eye Model

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